

Ex-ante evaluation of GM food crops with health benefits: the case of folate biofortified rice in China.

Benchmarking with other folate interventions;

A comparison of high risk regions: Shanxi versus Balrampur

Abstract:

Folate biofortification, i.e. enhancing the folate (vitamin B9) content of staple foods through transgenic breeding, could be a pro-poor, pro-rural, agriculture-based intervention to reduce the health burden of folate deficiency. While previous research already demonstrated the large potential to implement folate biofortified rice (FBR) in China, this study is the first to put such results into broader perspective.

First, the ex-ante health impact and cost-effectiveness of FBR in China are benchmarked against the currently existing studies on biofortified crops and target countries. Second, the costs to introduce FBR in China are compared with other folate interventions, i.e. folic acid fortification and supplementation.

The findings show that, based on a pessimistic and optimistic impact scenario, FBR is ranked, respectively, 15th and 20th out of 27 cost-effectiveness analyses. Moreover, nearly all biofortification strategies achieve the World Bank threshold of highly cost-effective interventions. The implementation costs to reduce folate deficiency in China lend further support to FBR (\$31.6M), compared to a country-wide folic acid supplementation (\$428.8M), a folic acid fortified wheat (\$184M) and soy sauce program (\$240M).

This study demonstrates the importance to incorporate ex-ante impact analyses into innovative biotechnology research and provides a benchmark tool to examine the potential of agriculture-based technologies.

Keywords:

biotechnology evaluation; transgenic biofortification; folate biofortified rice; health impact assessment; cost-effectiveness analysis; benchmarking; China